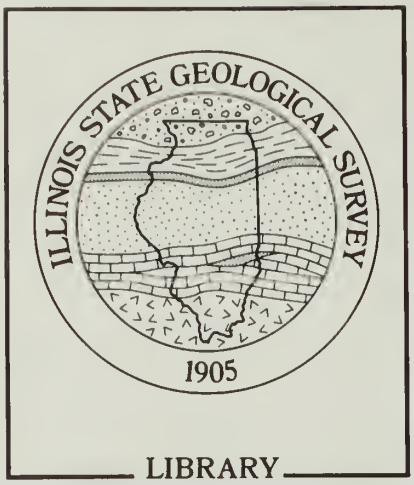
S
14.GS:
ANR 1991-92
v.2

Geol Survey

ILLINOIS STATE GEOLOGICAL SURVEY ANNUAL REPORT

July 1, 1991 – June 30, 1992

Publications


ILLINOIS STATE GEOLOGICAL SURVEY
1905
LIBRARY

Illinois Department of Energy and Natural Resources
State Geological Survey Division

PUBLICATIONS

July 1991 to June 1992

ILLINOIS GEOLOGICAL
SURVEY LIBRARY
MAR 10 1993

ILLINOIS STATE GEOLOGICAL SURVEY SERIES

(Released to the Public from July 1, 1991 through June 30, 1992)

Bulletins

97 *Geology of the Goreville Quadrangle, Johnson and Williamson Counties, Illinois.* 1992. **Jacobson, R. J.**, with contributions by S. P. Esling and T. A. Leonard. 32 p., 20 figs., 3 appendixes.

Circulars

548 *Upper Pennsylvanian Algal Bank Limestones on the Northern Margin of the Illinois Basin, Livingston, County, Illinois.* 1991. **Fraser, G. S.** 15 p., 6 figs.

549 *Benefits and Costs of Geologic Mapping Programs in Illinois: Case study of Boone and Winnebago Counties and Its Statewide Applicability.* 1991. **Bhagwat, S. B., and R. C. Berg.** 40 p., 2 figs., 5 tables, 3 appendixes.

Environmental Geology

140 *Illinois Geographic Information System Applications to Environmental Management.* 1991. **Krumm, R. J., A. L. Erdmann, and M. G. Joselyn.** 32 p., 13 figs., 1 table.

141 *Construction, Monitoring and Performance of Two Soil Liners.* 1991. **Krapac, I. G., K. Cartwright, B. R. Hensel, B. L. Herzog, T. H. Larson, S. V. Panno, J. B. Risatti, W. J. Su,** and K. R. Rehfeldt. 118 p., 63 figs., 33 tables.

142 *Optimal Time for Collecting Volatile Organic Chemical Samples from Slowly Recovering Wells.* 1991. **Chou, S-F. J., B. L. Herzog, J. R. Valkenburg, and R. A. Griffin.** 18 p., 6 figs., 7 tables, 2 appendixes.

Illinois Minerals

107 *Measuring Coal Seam Thicknesses With Normal-Lateral Electric Logs.* 1991. **Berggren, D. J.** 26 p., 5 figs., 3 tables, 2 appendixes, 4 appendix figs.

108 *Illinois Mineral Industry in 1989 and Review of Preliminary Mineral Production Data for 1990.* 1991. **Samson, I. E.** 43 p., 13 figs., 25 tables.

Illinois Petroleum

135 *Reservoir Heterogeneity and Improved Oil Recovery of the Aux Vases (Mississippian) Formation at King Field, Jefferson County, Illinois.* 1991. **Leetaru, H. E.** 49 p., 4 plates, 2 appendixes, 1 appendix fig.

Cooperative Groundwater Reports

13 *Regional Groundwater Resources in Western McLean and Eastern Tazewell Counties.* 1992. **Kempton, J. P.,** and A. P. Visocky. 41 p., 18 figs., 3 tables, 4 plates (published separately as Open File Series 1991-14).

14 *Pilot Study: Agricultural Chemicals in Rural, Private Wells in Illinois.* 1992. Schock, S. C., **E. Mehnert,** M. E. Caughey, **G. B. Dreher, W. S. Dey,** S. Wilson, C. Ray, **S-F. J. Chou, J. R. Valkenburg,** J. M. Gosar, J. R. Karny, **M. L. Barnhardt,** W. F. Black, M. R. Brown, and V. J. Garcia. 80 p., 17 figs., 30 tables, 2 appendixes.

Special Reports

1 *Geologic Mapping for the Future of Illinois.* 1992. **State Geological Survey.** 49 p., 20 figs., 5 tables.

Illinois Basin Series

Illinois Basin Consortium Program Plan. 1992. **Kolata, D. R.** (IL G. S.), B. D. Keith (IN G. S.) and J. A. Drahovzal (KY G. S.). 21 p., 2 figs., 2 appendixes.

Illinois Geologic Quadrangles (IGQ) and other ISGS Maps and Cross Sections

IGQ-7 *Geologic Map of the Goreville Quadrangle, Johnson and Williamson Counties, Illinois.* 1991. **Jacobson, R. J.**, with contributions by **H. H. Damberger and C. B. Trask.** Scale 1:24,000, 1 sheet.

IGQ-8 *Geologic Map of the Waltersburg Quadrangle, Pope County, Illinois.* 1991. **Weibel, C. P., W. J. Nelson, and J. A. Devera.** Scale 1:24,000, 1 sheet.

IGQ-9 *Geologic Map of the Glendale Quadrangle, Johnson and Pope Counties, Illinois.* 1991. **Devera, J. A.** Scale 1:24,000, 1 sheet.

Illinois Coal Mine Maps and Directories. 1991. **Bargh, M. H.** 80 Maps (scale 1:100,000) and 73 directories (1 for each of 73 counties).

Geologic Map of Illinois. 1967 (reprinted in 1991). **Willman, H. B.** and others [compilers]. Color, scale 1:500,000.

Oil and Gas Development Maps. 1991. **Frankie, W. T., and S. Olt.** Computer generated. Scale 1:31,680. No. 17 - Carbondale; No. 24 - Du Quoin; No. 33 - Roaches; No. 34 - Mt. Vernon; No. 35 - Fairfield; No. 42 - Xenia; No. 43 - Centralia; No. 44 - Carlyle.

Oil and Gas Development Maps. 1992. **Frankie, W. T., and S. Olt.** Computer generated. Scale 1:31,680. No. 9 - Cave in Rock; No. 10 - Rosiclare; No. 11 - New Burnside; No. 12 - Goreville; No. 13 - Alto Pass; No. 16 - Murphysboro; No. 18 - Thompsonville; No. 22 - McLeansboro; No. 23 - Benton; No. 25 - Pinckneyville; No. 32 - Nashville; No. 40 - Noble; No. 41 - Clay City; No. 59 - Effingham; No. 71 - Shelbyville; No. 72 - Mattoon.

Monthly Drilling Report

657-668 *Monthly Report on Oil and Gas Drilling in Illinois.* **Huff, B. G., and Y. Liu.** July 1991 to June 1992. Approx. 18 p. each.

Geological Science Field Trip Guides

1991C *Guide to the Geology of the Decatur Area, Macon and Christian Counties.* 1991. **Reinertsen, D. L., J. M. Masters, L. R. Follmer, A. K. Hansel, P. C. Reed, R. H. Howard, and S. T. Whitaker.** 40 p., 18 figs.

1991D *Guide to the Geology of the Pere Marquette Sate Park Area, Jersey County.* 1991. **Reinertsen, D. L., and J. D. Treworgy.** 32 p., 11 figs.

1992A *Guide to the Geology of the Cave in Rock and Rosiclare Area, Hardin County.* 1992. **Reinertsen, D. L.** 38 p., 15 figs.

1992B *Guide to the Geology of the Galena Area, Jo Daviess County, Illinois, Lafayette County, Wisconsin.* 1992. **Reinertsen, D. L.** 38 p., 14 figs.

Guidebooks

20 *Quaternary Records of Central and Northern Illinois.* 1986 (reprinted 1990). **Follmer, L. R., D. P. McKenna, and J. E. King,** editors. 85 p., 20 figs., 1 table. 2 appendixes.

22 *Quaternary Records of Northeastern Illinois and Northwestern Indiana.* 1986 (reprinted 1991). **Hansel, A. K.,** and W. H. Johnson, with contributions by K. L. Cole, T. Thompson, P. Clark, R. Gergen, K. Nelson, J. E. King, and J. Oliver. 106 p., 44 figs., 4 tables.

Educational Series

4 *Guide for Beginning Fossil Hunters.* 1959 (reprinted 1991). **Collinson, C. W.** 40 p., 32 illustrations (including 11 plates).

5 *Guide to Rocks and Minerals of Illinois.* 1959 (reprinted 1991). **State Geological Survey.** 40 p., 11 figs., 1 table.

Open File Series

1990-2E *Stack-Unit Map to a Depth of 15 m of Kane County.* **Curry, B. B.** Scale 1:62,500.

1991-7R *Potential for Agricultural Chemical Contamination of Aquifers in Illinois.* 1991. **McKenna, D. P., and D. A. Keefer.** 18 p.

1991-7S *Potential for Agricultural Chemical Contamination of Aquifers in Illinois.* 1991. **McKenna, D. P., and D. A. Keefer.** Color, scale 1:500,000.

1991-8 *Process Development for Production of Coal/Sorbent Pellets: Final Technical Report, September 1, 1990 through August 31, 1991.* 1991. **Rapp, D. M., J. M. Lytle, K. C. Hackley, D. L. Moran,** F. Becvar, M. J. Demers, R. L. Berger, G. Schanche, and D. Bannerjee. 26 p.

1991-9 *Production of Superclean Coal by Wet-Grinding and Selective Flocculation.* 1991. **Chou, C.-L., C. A. Woodward, and C. Chaven.** 1991. 23 p.

1991-11 *Optimal Time for Collecting Volatile Organic Chemical Samples from Slowly Recovering Wells: Appendixes.* 1991. **Chou, S.-F. J., B. L. Herzog, J. R. Valkenburg, and R. A. Griffin.** 43 p.

1991-12 *Hydrogeology of Shallow Groundwater Resources, Aurora and Vicinity, Kane County, Illinois.* 1991. **Larson, T. H., S. S. McFadden, and R. H. Gilkeson.**

1991-13 *Hydrogeology of Shallow Groundwater Resources in the Vicinity of St. Charles, Kane County, Illinois.* 1991. **Morse, W. J., and T. H. Larson.** 12 p.

1991-14A *Location and Summary of Well and Test-Hole Data.* (From Coop 13: "Regional Groundwater Resources in Western McLean and Eastern Tazewell Counties with Emphasis on the Mahomet Bedrock Valley"). 1991. **Kempton, J. P.,** and A. P. Visocky. Scale 1:62,500.

1991-14B *An Interpretation of the Bedrock Topography of the Confluence Area of the Mahomet and Mackinaw Bedrock Valleys.* (From Coop 13: "Regional Groundwater Resources in Western McLean and Eastern Tazewell Counties with Emphasis on the Mahomet Bedrock Valley"). 1991. **Kempton, J. P.,** and A. P. Visocky. Scale 1:62,500.

1991-14C *Distribution and Elevation of the Top of the Mahomet-Sankoty Sand.* (From Coop 13: "Regional Groundwater Resources in Western McLean and Eastern Tazewell Counties with Emphasis on the Mahomet Bedrock Valley"). 1991. **Kempton, J. P.,** and A. P. Visocky. Scale 1:62,500.

1991-14D *Occurrence of Mahomet-Sankoty Sand and Probable Aquifer Characteristics.* (From Coop 13: "Regional Groundwater Resources in Western McLean and Eastern Tazewell Counties with Emphasis on the Mahomet Bedrock Valley"). 1991. **Kempton, J. P.,** and A. P. Visocky. Scale 1:62,500.

1991-15 *Results of a Shallow Seismic Refraction Survey Near the Village of North Aurora, Illinois.* 1991. **Larson, T. H., and P. G. Orozco.** 18 p.

1992-1 *Characterization of Organic Sulfur in Macerals and Chars.* 1992. **Harvey, R. D., and I. Demir.** 23 p.

1992-2 *Southwest-Northeast Cross Section in the Illinois Basin: Southeastern Flank of Ozark Dome, Missouri to Southern Illinois.* 1992. **Treworgy, J. D., S. T. Whitaker, and M. L. Sargent.**

1992-3 *Northwest-Southeast Cross Section in the Illinois Basin: Sparta Shelf, Southern Illinois to Rough Creek Graben, Western Kentucky.* 1992. **Whitaker, S. T., J. D. Treworgy, M. L. Sargent,** and M. C. Noger.

1992-4 *West-East Cross Section in the Illinois Basin: Ozark Dome, Missouri to Rough Creek Graben, Western Kentucky.* 1992. **Sargent, M. L., J. D. Treworgy, and S. T. Whitaker.**

1992-5 *Hydrogeology of Shallow Groundwater Resources: Geneva-Batavia Township, Kane County, Illinois.* 1992. **Larson, T. H., S. S. McFadden, and R. H. Gilkeson.** 17 p.

1992-6 *Hydrogeologic Environments Along the Fox River Valley in Kane County, Illinois.* 1992. **Fitzpatrick, F. A., T. H. Larson, S. S. McFadden, and R. H. Gilkeson.** 26 p.

1992-7 *Quaternary Geology of the Creal Springs 7.5-Minute Quadrangle, Illinois.* 1992. **Riggs, M. H.,** M. S. Lannon, S. P. Esling, and **L. R. Follmer.** Scale 1:24,000.

1992-8 *Quaternary Geology of the Eddyville 7.5-Minute Quadrangle, Illinois.* 1992. Henderson, E. D., M. S. Lannon, S. P. Esling, **M. H. Riggs, and L. R. Follmer.** Scale 1:24,000.

1992-9 *Quaternary Geology of the Stonefort 7.5-Minute Quadrangle, Illinois.* 1992. Lannon, M. S., S. P. Esling, **M. H. Riggs, and L.R. Follmer.** Scale 1:24,000.

1992-10 *6 O'Clock Cross Section in the Illinois Basin, Wayne County, Illinois, to Gibson County, Tennessee.* 1992. **Whitaker, S. T., J. D. Treworgy,** and M. C. Noger. Vertical scale 1:4,800, horizontal scale 1:250,000.

Reprints

1991K *Water Movement Through an Experimental Soil Liner.* **Krapac, I. G., K. Cartwright, S. V. Panno, B. R. Hensel,** K. R. Rehfeldt, and **B. L. Herzog.** 10 p., 3 figs., 2 tables.

1991L *Introduction to Geology and Hydrogeology of the Teays-Mahomet Bedrock Valley System.* 1991. Melhorn, W. N., and **J. P. Kempton.** 2 p.

Mahomet Bedrock Valley in East-Central Illinois; Topography, Glacial Drift Stratigraphy, and Hydrogeology. 1991. **Kempton, J. P.,** W. H. Johnson, **P. C. Heigold, and K. Cartwright.** 34 p., 24 figs.

The Teays System; A Summary. Melhorn, W. N. and **J. P. Kempton.** 4 p. 2 figs.

1991M *Variation of Organic Sulfur in Macerals of Selected Illinois Basin Coals.* 1991. **Demir, I., and R. D. Harvey.** 8 p., 10 figs., 4 tables.

1991N *Distribution and Forms of Chlorine in Illinois Basin Coals.* 1991. **Chou, C.-L.** 19 p., 9 figs., 1 table.

1991O *Effects of Wetlands Creation on Groundwater Flow.* 1991. **Hensel, B. R., and M. V. Miller.** 22 p., 12 figs., 3 tables.

1991P *Benefits of Using Calcium Oxide Additive in the Mild Gasification of Coal.* 1991. **Kruse, C. W., A. D. Williams, and C. Feizoulof.** 11 p., 6 figs., 2 tables.

1991Q *The Youngest Carpoid: Occurrence, Affinities and Life Mode of a Pennsylvanian (Morrowan) Mitrate from Oklahoma.* 1991. **Kolata, D. R.,** T. J. Frest, and R. H. Mapes. 12 p., 9 figs., 1 table.

1991R *Importance of Geologic Characterization of Potential Low-Level Radioactive Waste Disposal Sites.* 1991. **Weibel, C. P., and R. C. Berg.** 6 p., 3 figs.

1991S *Chapter 32. Coalification in North American Coal Fields.* 1991. **Damberger, H. H.** 20 p., 11 figs., 1 table.

1992A *Environmental Benefits vs. Costs of Geologic Mapping.* 1992. **Bhagwat, S. B., and R. C. Berg.** 8 p., 1 table.

1992B *Is Coal Price Linked to Oil Prices? Analysis of U.S. Fossil Fuel Prices in 1971-1988.* 1992. **Bhagwat, S. B.** 10 p., 6 figs., 1 table.

1992C *Paleopedology and Conodont Biostratigraphy of the Mississippian-Pennsylvanian Boundary Interval, Type Grove Church Shale Area, Southern Illinois.* 1992. **Weibel, C. P., and R. D. Norby.** 15 p., 6 figs., 2 plates, 1 table.

1992D *An Analytical Study of a Two-Layer Transient Thermal Conduction Problem as Applied to Soil Temperature Surveys.* 1992. **Larson, T. H.,** and A.T. Hsui. 7 p., 4 figs., appendix.

1992E *Thrust Faults in Southern Illinois Basin—Result of Contemporary Stress.* 1992 (second reprinting). **Nelson, W. J., and R. A. Bauer.** 6 p., 8 figs.

Other Publications

1991 Additions to the Geological Samples Library. 1991. **Zelinsky, C. J.** 13 p.

Geonews. December 1991.

Index to Topographic Maps of Illinois. Scale 1:1,000,000.

Illinois State Geological Survey Annual Report for Fiscal Year 1991. 1991. 119 p.

Illinois State Geological Survey Interim Report for the Period January 1 to June 30, 1991. 1991. 48 p.

Illinois State Geological Survey Interim Report for the Period July 1 to December 31, 1991. 1992. 37 p.

Illinois State Geological Survey Addresses Challenges for a Healthy Economy and a Healthy Environment. 1992. **Muckensturm, S.** 25 p., 25 photographs.

Final Contract Reports and Other Public Documents

Bauer, R. A., and B. A. Trent. 1991. *Program Assessment Report for Fiscal Year 1991. Illinois Mine Subsidence Research Program.* Submitted to the Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. 24 p.

Bauer, R. A., and B. A. Trent. 1992. *Illinois Mine Subsidence Research Program Implementation Plan for Fiscal Year 1993.* Submitted to the Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. 14 p.

Bauer, R. A., D. J. Van Roosendaal, B.B. Mehnert, and B. A. Trent. 1991. *Illinois Mine Subsidence Research Program, Monitoring and Research.* Final contract report for the period July 1, 1990 to June 30, 1991. Submitted to Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. 25 p.

Chrzastowski, M. J., and C. B. Trask. 1992. *Review of the Final Report for the 1991 Beach and Nearshore Monitoring Program at Forest Park Beach, Lake Forest, IL.* Final contract technical report for contract No. WR-09118/SRA-190. Submitted to Illinois Department of Transportation, Division of Water Resources. Springfield. 64 p. 4 appendixes.

Collinson, C., C. S. Fucciolo, J. J. Miner, R. A. Lambert, and J. R. Jennings. 1991. *Littoral Zone Habitat Classification and Mapping.* Final contract technical report for the period July 1, 1990 to June 30, 1991 for Segment I. Illinois Department of Conservation Project No. F-112-R. Springfield.

DeBarr, J. A., M. Rostam-Abadi, R. D. Harvey, S. A. Benson, and D. L. Toman. 1991. *Reactivity and Combustion Properties of Coal-Char Blend Fuels.* Final contract technical report submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

Ehrlinger III, H. P., J. M. Lytle, L. B. Kohlenberger, D. M. Rapp, R. M. Sterner, D. W. Norris, J. D. Stephenson, J. W. Amos, and E. E. Zipperian. 1991. *Fine Coal Flotation of Plant Waste—Comparison of Column versus Subaeration Cells.* Final contract technical report submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

FitzPatrick, J. A., **J. B. Risatti,** and B. You. 1991. *Microbial Suppression of Pyrite from Reagents and Scale-Up.* Final contract technical report submitted to the Center for Research on Sulfur in Coal. Carterville, IL. 25 p.

Goheen, C. H., D. S. Joshi, and S. B. Bhagwat. 1991. *An Economic Evaluation of Conceptual Commercial-Scale Coal Desulfurization Plants Based on Ethanol and Carbon Monoxide-Ethanol Processes.* Final contract report submitted to the Department of Energy and Natural Resources, August 20, 1991. Contract No. SCCA-90-82117WU.

Hackley, K. C., and C.-L. Liu. 1992. *Application of Environmental Isotopes to Assess Monitoring Well G18S at Lake Landfill.* Final contract technical report submitted to Waste Management of Illinois, Inc. Oak Brook, IL.

Harvey, R. D., and I. Demir. 1991. *Characterization of Organic Sulfur in Macerals and Chars.* Final contract technical report submitted to the Center for Research on Sulfur in Coal. Carterville, IL. 21 p.

Hensel, B. R., K. Cartwright, M. L. Barnhardt, and A. K. Hansel. 1992. *Predicted Impacts of a New Highway on a Spring-Fed Wetland.* Final contract report to the Illinois Department of Transportation, Division of Highways. Springfield. 23 p.

Herzog, B. L., D. R. Larson, et al. 1991. *The FY 1991 Aquifer Assessment Research Projects at the ISGS.* Final contract technical report submitted to the Illinois Department of Energy and Natural Resources. Springfield.

Herzog, B. L., and V. L. Poole. 1992. *Background Information on Cross Sections Prepared for the Illinois Department of Mines and Minerals for Use in Determining the U.S. Drinking Water Limit.* ISGS White Paper. Champaign. 5 p.

Khan, L. A. 1991. *Recovery of Coal Fines from Preparation Plant Effluents.* Final contract technical report submitted to Praxis Engineers for inclusion in their report to the Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield.

Kruse, C. W., C. Chaven, H. P. Ehrlinger III, D. M. Rapp, L. B. Kohlenberger, D. Gavrilovic, and K. S. Vorres. 1991. *Illinois Basin Coal Sample Program.* Final contract technical report for the period September 1, 1990 to August 31, 1991. Submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

Kruse, C. W., C. L. Knudson, D. N. Assanis, **H. P. Ehrlinger III, M. Rostam- Abadi, and C. Feizoulof.** 1991. *Lignin-Augmented Bituminous Coal Depolymerization: A Route to Clean Fuels.* Final contract technical report for the period September 1, 1989 to August 31, 1991. Submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

Kruse, C. W., J. M. Lytle, M. Rostam-Abadi, M.-I. M. Chou, C. Feizoulof, S. M. Fatemi-Badi, T. Fleisch, and Y. C. Lin. 1991. *Upgrading Mild Gasification Char: Evaluation of Oxidized Char as a Catalyst.* Final contract technical report for the period September 1, 1990 to August 31, 1991. Submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

Lizzio, A. A., and M. Rostam-Abadi. 1991. *Production of Carbon Molecular Sieves from Illinois Coal.* Final contract technical report for the period September 1, 1990 to August 31, 1991. Submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

McKenna, D. P., J. B. Risatti, W. R. Roy, I. G. Krapac, and E. Mehnert. 1992. *Progress Report for the Project Groundwater Contributions to Atrazine Loadings in Streams for the period January 1 to December 31, 1991.* Submitted to Office of Research Development and Administration. Southern Illinois University. Carbondale, IL. 48 p.

Mehnert, B. B., D. J. Van Roosendaal, and N. Kawamura. 1991. *Overburden Characterization for Heron Road Subsidence Site.* Final contract technical report to the U.S. Bureau of Mines in fulfillment of purchase order no. 213293. Minneapolis. 35 p.

Rapp, M., J. M. Lytle, K. C. Hackley, D. L. Moran, S. Becvar, M. J. Demers, R. L. Berger, and G. Schancke. 1991. *Process Development for Production of Coal/Sorbent Agglomerate.* Final contract technical report for the period September 1, 1990 to August 31, 1991. Submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

Rostam-Abadi, M., and D. L. Moran. 1991. *Evaluation of High Surface Area Hydrated Lime for SO_2 Control.* Final contract technical report for the period September 1, 1990 to August 31, 1991. Submitted to the Center for Research on Sulfur in Coal. Carterville, IL.

Rostam-Abadi, M., D. L. Moran, J. J. Eidel, J. M. Lytle, C. W. Kruse, and M. Lordgooei. 1991. *Development and Advancement of High Surface- Area Hydrated Lime Production and Use.* Final contract technical report for the period August 1, 1990 to July 31, 1991. Submitted to the Illinois Department of Commerce and Community Affairs. Springfield.

Roy, W. R., I. G. Krapac, and J. D. Steele. 1992. *Sorption by Clays of Cadmium and Lead from Municipal Incinerator-Ash Leachate.* Final contract technical report to the U.S. Environmental Protection Agency. Cincinnati.

Roy, W. R., D. P. McKenna, and I. G. Krapac. 1991. *Procedures and Guidelines for Evaluating Pesticide Contamination at Agrichemical Facilities in Illinois.* Draft discussion document submitted to the Illinois Department of Agriculture in partial fulfillment of Task 2—What constitutes pesticide contamination? 39 p.

Su, W.-J. 1992. *Landslides in the New Madrid Sesimic Zone: Landslide Inventory and Risk Assessment in Illinois Along the Ohio and Mississippi Rivers from Olmsted to Chester, Illinois.* Final contract technical report submitted to U.S. Geological Survey. Branch of Earthquakes, Volcanoes and Engineering Geology. Reston, VA. 147 p.

Weibel, C. P. 1991. *Correlation of Upper Pennsylvanian Bedrock Strata at the Geff Alternative Site, Wayne County, Illinois.* Contract technical report submitted to Battelle Memorial Institute. Columbus. 35 p.

EXTERNAL PUBLICATIONS

Abstracts

Bakel, A. J., and **J. B. Risatti.** 1992. *Oil-oil correlations in the Illinois Basin by compound-specific isotopic analyses (CSIA).* Proceedings of the American Chemical Society, Geochemistry Division. San Francisco. April 4-11, 1992. Abstract No. 159.

Barnhardt, M. L. 1992. *Analysis of erosion and sedimentation along entrenching gully systems.* Abstracts, Association of American Geographers, San Diego. April 18-22, 1992. p. 13.

Barnhardt, M. L., and K. P. McCarthy. 1991. *Identifying and classifying zones of erosion and deposition along a gully channel.* Agronomy Abstracts. American Society of Agronomy. Denver. October 27- November 1, 1991. p. 324.

Baxter, J. W., W. Anderson, T. S. Hayes, and **R. R. Pool.** 1992. *Vein and bedded fluorspar mineralization in the Paducah 1° x 2° quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 2-3.

Baxter, J. W., L. R. Smith, B. J. Stiff, G. Dever, Jr., W. A. Anderson, A. Rueff, and M. McFarland. 1992. *Assessment of the limestone and dolomite resources of the Paducah 1° x 2° quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors.

Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 4-5.

Beaty, D. S., K. R. McGee, and B. Seyler. 1991. *Effects of diagenesis on reservoir quality within two Cypress reservoirs in the Illinois Basin.* American Association of Petroleum Geologists Bulletin. V. 75, No. 8. p. 1379.

Berg, R. C., M. R. Greenpool, W. Whitfield, W. W. Olive, and J. Rupp. 1992. *Surficial deposits of the Paducah 1° x 2° quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** eidtors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 5-6.

Bergstrom, S. M., W. D. Huff, and **D. R. Kolata.** *Giant Middle Ordovician ash falls in northwestern Europe and eastern North America and their event-stratigraphic and biologic significance.* Event Markers in Earth History, Joint Meeting of International Geological Correlation Projects 216, 293 & 303, Abstracts. Calgary, Alberta. p. 16.

Bergstrom, S. M., W. D. Huff, **D. R. Kolata,** H. Bauert, and D. Kaljo. 1991. *The Ordovician K-bentonite project, Part II: Distribution and significance in northwestern Europe.* Sixth International Symposium on the Ordovician System. Sydney, Australia. p. 10.

Bergstrom, S. M., **D. R. Kolata,** and W. D. Huff. 1991. *Geologic significance of gigantic ash falls in the Ordovician of North America and northwestern Europe.* Ohio Journal of Science. V. 91, p. 34.

Bergstrom, S. M., **D. R. Kolata,** and W. D. Huff. 1991. *Middle Ordovician K-bentonites in Baltoscandia and North America: Biostratigraphic relations and paleontological implications.* Geological Society of America, Abstracts with Programs. V. 23, No. 5. p. A296.

Booth, C. J., P. J. Carpenter, E. Spande, **J. T. Kelleher III, B. B. Mehnert, and D.J. Van Roosendaal.** 1991. *Geological control of the hydrogeological effects of longwall mining: New interpretations from recent IMSRP studies in Illinois.* Geological Society of America, Abstracts with Programs. V. 23, No. 5. p. A39.

Chou, C.-L. 1992. *Geochemistry of black shales in the Illinois Basin: A review of recent literature.* Proceedings of the 1991 Eastern Oil Shale Symposium. Institute for Mining and Minerals Research. University of Kentucky. Lexington. p. 415.

Choudhry, V., **L. A. Khan,** and D. Yang. 1991. *Recovery of coal fines from preparation plant effluents.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 17.

Chrzastowski, M. J. 1992. *Human influence on the coastal evolution of the Illinois shore of Lake Michigan.* Geological Society of America, Abstracts with Programs. V. 24, No. 2. p. 8.

Chrzastowski, M. J. 1991. *North American late Quaternary coastal evolution: Similarities and contrasts between the Great Lakes coast of southern Lake Michigan and the U.S. Mid-Atlantic coast.* In Zhao, X. and L. Bo, editors. Abstracts of the International Geological Correlation Program, Project 274, 1991 Symposium. Hainan Island, China. Academia Sinica, Institute of Geology. Beijing. p. 2.

Chrzastowski, M. J., and P. D. Terpstra. 1992. *Monitoring of 1990-1991 beach and nearshore geomorphic changes at North Point Marina, Winthrop Harbor, IL.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 9.

Chrzastowski, M. J., P. D. Terpstra, and T.A. Thompson. 1992. *The fit of a logarithmic-spiral curve to the Illinois-Indiana shore of Lake Michigan.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 9.

Cole, R. D. 1991. *Marine sandstone facies in the Mississippian Cypress Formation: Alternative interpretations for previously described distributary channels in southern Illinois.* Geological Society of America, Abstracts with Programs, V. 23, No. 5, p. A286.

Coleman, D. D., and C.-L. Liu. 1991. *Identification of landfill gas using radiocarbon dating.* Radiocarbon. V. 33, No. 2. p. 187.

Curry, B. B. 1991. *Statistical evaluation of common geotechnical parameters of glacial drift units at Fermi National Accelerator Laboratory, Batavia, Illinois.* Proceedings, 34th Annual Meeting, Association of Engineering Geologists. St. Charles, IL. September 29- October 4, 1991. p. 258.

Curry, B. B. 1991. *Summit Lake landslide, Nevada: An example of a small, long run-out landslide.* Geological Society of America, Abstracts with Programs. V. 23, No. 5. p. 126.

Curry, B. B., R. M. Forester, and N. K. Bleuer. 1992. *Paleohydrology of lakes as a means for climatic reconstruction: Examples of full glacial records from a midwestern pond and slackwater basin.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 11.

DeBarr, J. A., M. Rostam-Abadi, D. L. Toman, and S. A. Benson. 1991. *Combustion characteristics of coal-char blend fuels.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 24.

Demir, I., and R. D. Harvey. 1991. *Characterization of organic sulfur in macerals and chars.* Proceedings, 8th Annual Meeting, Society of Organic Petrology. Lexington, KY. September 29 to October 1, 1991. No pagination.

Ehrlinger III, H. P., L. B. Kohlenberger, D. M. Rapp, J. M. Lytle, J. Stephenson, D. Zipperian, R. M. Sterner, and D. W. Morris. 1991. *Fine coal flotation of plant waste: An in-plant comparison—columns vs sub-a cells.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 15.

Eidel, J. J., R. B. Berg, J. M. Masters, A. Rueff, and **B.J. Stiff.** 1992. *Tripoli (microcrystalline silica) resources of the Paducah quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 8.

Eidel, J. J., and M. B. Goldhaber. 1992. *The Paducah CUSMAP—A broad spectrum of resources in a rift-related interior cratonic basin.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 9-11.

Follmer, L. R. 1991. *A scale for interpretation of soil development.* Proceedings, 13th Research Congress, International Union for Quaternary Research (INQUA). Beijing, China. p. 99.

Follmer, L. R. 1991. *Savana soil dynamics in central Illinois.* Central Illinois Prairie Conference. Eastern Illinois University. Charleston, IL. p. 8.

Goldhaber, M. B., H.A. Folger, C. D. Taylor, E. L. Mosier, C. Gent, **K. C. Hackley, and J. M. Masters.** 1992. *Paducah CUSMAP subsurface geochemical studies.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 14-16.

Goldhaber, M. B., T. S. Hayes, **J. J. Eidel,** E. J. LaRock, and **M. L. Sargent.** 1992. *Assessment of Mississippi Valley-type mineralization examples from the Middle Ordovician Dutchtown Formation.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 16- 18.

Grube, J. P. 1991. *Reservoir characterization of multiple-bar sandstones in the Mississippian Cypress Formation, Tamaroa Field, Perry County, Illinois.* American Association of Petroleum Geologists Bulletin. V. 75, No. 8. p. 1383.

Hackley, K. C., C.-L. Liu, and D. D. Coleman. 1991. *Radiocarbon dating of groundwater containing microbial methane.* Radiocarbon. V. 33, No. 2. p. 204-205.

Haney, D. C., N. C. Hester, and **M. W. Leighton.** 1992. *The Illinois Basin consortium.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 18-19.

Hansel, A. K., and W. H. Johnson. 1992. *Origin and significance of a layered diamicton facies at Wedron, Illinois.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 19.

Harvey, R. D., and I. Demir. 1991. *Characterization of the organic sulfur in macerals and chars.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 37.

Hasenmuller, N. R., W. S. Boberg, J. Comer, Z. Smidchens, **W. T. Frankie, D. K. Lumm,** T. Hamilton-Smith, and J. D. Walker. 1992. *Study of gas production potential of New Albany Shale (Group) in the Illinois Basin.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 19.

Hayes, T. S., E. J. LaRock, J. Gaines, C. M. Seeger, **Z. Lasemi,** and W. W. Olive. 1992. *Mapping lithologic criteria for mineral deposit potential using a subsurface lithologic database interactive with ARC/INFO.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 23-25.

Hensel, B. R., S. V. Panno, K. Cartwright, M. V. Miller, I. G. Krapac, and V. Nuzzo. 1991. *Ecohydrology of a pristine fen.* Geological Society of America, Abstracts with Programs. V. 23, No. 5. p. A324.

Hildenbrand, T. G., R. P. Kucks, and **P. C. Heigold.** 1992. *Geologic and structural evolution of the southern Illinois Basin based on potential-field studies.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 25-26.

Huff, W. D., S. M. Bergstrom, and **D. R. Kolata.** 1991. *The Ordovician K-bentonite project III: Trans-Iapetus stratigraphic and tectonomagmatic significance.* Sixth International Symposium on the Ordovician System. Sydney, Australia. p. 18.

Hughes, R. E., D. A. Grimley, **L. R. Follmer, D. M. Moore,** and W. H. Johnson. 1991. *Occurrence and rates of formation of mixed-layered kaolinite/expandables in Quaternary loess of the Mississippi Valley.* Clay Minerals Society of America, Abstracts. p. 14.

Hughes, R. E., W. W. Olive, A. Rueff, **J. W. Baxter,** W. Anderson, M. McFarland, and **B. J. Stiff.** 1992. *Assessment of the clay and shale resources of the Paducah 1° x 2° quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1, p. 28- 29.

Hughes, R. E., J. M. Masters, J. W. Baxter, J. J. Eidel, R. B. Berg, **R. R. Pool, L. R. Smith, B. J. Stiff,** W. Anderson, G. Dever, Jr., T. S. Hayes, M. McFarland, W. Olive, and A. Rueff. 1992. *Economic potential for industrial minerals in the Paducah CUSMAP quadrangle, southern Illinois and adjacent Kentucky and Missouri: The results of GIS composites of resource models.* Abstracts with Programs. 28th Forum on the Geology of Industrial Minerals. Martinsburg, WV, May 3-8, 1992. West Virginia Geological and Economic Survey. Morgantown.

Hwang, H.-H. 1992. *Origin of shallow saline groundwater in the central and southern Illinois Basin.* In Goldhaber, M. B, and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 29-30.

Johnson, B. R., **R. R. Pool,** G. N. Green, and **B. J. Stiff.** *Digital mineral deposit models and geographic information systems as resource assessment tools.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 30-32.

Johnson, D. L., C. L. Balek, and **L. R. Follmer.** 1991. *Loess-buried, Quaternary drift landscapes with stone lines: A genetic reinterpretation using chronograph analysis and triple planationbiomantle theory.* Geological Society of America, Abstracts with Programs, V. 23, No. 5. p. 62.

Johnson, W. H., **A. K. Hansel, and B. J. Stiff.** 1991. *Glacial transport rates, late Wisconsinan Lake Michigan lobe in Central Illinois: Implications for transport mechanisms and ice dynamics.* Geological Society of America, Abstracts with Programs. V. 23, No. 5. p. A61.

Kolata, D. R. 1992. *The Illinois Basin: Archive of the Paleozoic sequences.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 27.

Kolata, D. R., W. D. Huff, and S. M. Bergstrom. 1991. *The Ordovician K-bentonite project, Part I: Distribution and significance in eastern North America.* Sixth International Symposium on the Ordovician System. Sydney, Australia. p. 19.

Kolata, D. R., W. D. Huff, and S. M. Bergstrom. 1992. *Distribution and event-stratigraphic significance of a Middle Ordovician K-bentonite bed in North America and Baltoscandia.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 27.

Kolata, D. R., and W. J. Nelson. 1992. *Evolution of the Illinois Basin.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 33-34.

Kolata, D. R., W. J. Nelson, J. D. Treworgy, S. T. Whitaker, M. L. Sargent, L. C. Furer, and M. C. Noger. 1992. *Evolution of the Illinois Basin.* 8th Annual Vincent McKelvey Forum on Energy and Mineral Resources. Houston. U.S. Geological Survey Circular 1074. p. 44.

Krumm, R. J., E. D. McKay III, C. C. Abert, M. M. McLean, M. H. Riggs, R. R. Pool, and L. R. Smith. 1991. *Using GIS with volume modeling to support the landfill screening process.* Abstracts with Programs, Fifth Annual Midwest/Great Lakes ESRI User Conference. Indianapolis. October 23-25, 1991.

Kruse, C. W., M.-I. M. Chou, C. Feizoulof, M. Fatemi, P. Beaulieu, and J. Schreiner. 1992. *Oxidized coal char as a catalyst: I. Characterization.* American Chemical Society, Fuel Chemistry Division, Abstracts of Papers.

Kruse, C. W., H. P. Ehrlinger III, M. Rostam-Abadi, and C. Feizoulof. 1991. *Lignin-augmented bituminous coal depolymerization: A route to clean fuels.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 4.

Kruse, C. W., K. C. Hackley, I. Demir, R. D. Harvey, and D. H. Buchanan. 1991. *Illinois Basin coal sample program.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 52.

Kruse, C. W., J. M. Lytle, M. Rostam-Abadi, M. Chou, C. Feizoulof, S. M. Fatemi, J. Mahoney, P. Beaulieu, and J. Schreiner. 1991. *Upgrading mild gasification char: Evaluation of oxidized char as a catalyst.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 8.

LaRock, E. J., T. S. Hayes, G. N. Green, and **M. L. Sargent.** 1992. *Subsurface lithologic mapping for mineral resource potential assessment of the Paducah CUSMAP quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 34-35.

Larson, D. R., R. C. Anderson, R. C. Vaiden, C. A. Chenoweth, and B. L. Herzog. 1992. *The hydrogeologic setting of the principle glacial-drift aquifers in the Green River lowland and associated bedrock valley system, northwestern Illinois.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 27-28.

Leetaru, H. E. 1991. *Depositional facies and hydrocarbon reservoir compartmentalization of the Mississippian Aux Vases Formation at King Field, Jefferson County, Illinois.* American Association of Petroleum Geologists Bulletin. V. 75, No. 8. p. 1386.

Masters, J. M., W. W. Olive, A. Rueff, **J. W. Baxter,** W. Anderson, M. McFarland, and **B. J. Stiff.** 1992. *Assessment of the construction sand and gravel and industrial sand resources of the Paducah 1° x 2° quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,**editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1, p. 38-39.

Miller, M. V., and B. L. Rhoads. 1992. *Geomorphic and geohydrological assessment for the management of constructed wetlands.* Abstracts for the Annual Meeting, American Association of Geographers. Miami. April 12-16, 1992.

Nelson, W. J. 1991. *Recurrent faulting and petroleum accumulation, Cat Creek anticline, central Montana.* American Association of Petroleum Geologists Bulletin. V. 75, No. 6. p. 1134.

Nelson, W. J. 1992. *Structural geology of the Paducah quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 42.

Oltz, D. F., J. E. Crockett, R. Mast, **R. H. Howard,** J. A. Rupp, and M. C. Noger. 1992. *Oil and gas potential in Paducah quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S.Geological Survey Open File Report 92-1. p. 42-43.

Oltz, D. F., H. E. Leetaru, S. T. Whitaker, E. O. Udegbunam, and D.S. Beaty. 1992. *The improved oil recovery and reservoir characterization program in Illinois.* Proceedings of the 23rd Annual Appalachian Petroleum Geology Symposium: Mississippian Plays in the Appalachian Basin—Shallow Targets for Tough Times. Morgantown, WV. March 30-April 2, 1992.

Panno, S. V., K. C. Hackley, K. Cartwright, and C.-L. Liu. 1992. *Hydrochemistry of the Mahomet Valley aquifer.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 58.

Peppers, R. A., and R. D. Harvey. 1992. *Distribution of boghead algae in Illinois Basin coal beds.* Abstracts and Program, Ninth Annual Meeting, Society of Organic Petrology. p. 48.

Potter, C. J., **P. C. Heigold,** C. D. Taylor, and M. B. Goldhaber. 1992. *Interpretation of a regional seismic reflection line, southern Illinois Basin: Cambrian rifting, Illinois-Kentucky fluorspar district faulting, and Hicks Dome genesis.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 49-51.

Rapp, D. M., J. M. Lytle, K. C. Hackley, D. L. Moran, D. Berger, and K. Griggs. 1991. *Process development for the production of coal/sorbent agglomerates.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 14.

Rostam-Abadi, M., and A. Lizzio. 1991. *Production of carbon molecular sieves from Illinois coal.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 45.

Rostam-Abadi, M., D. L. Moran, M. Lordgooei, J. M. Lytle, J. J. Eidel, C. W. Kruse, F. Anderson, and W. Bowman. 1991. *Development and evaluation of high surface-area hydrated lime for SO_2 control.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 38.

Sargent, M. L., J. D. Treworgy, S. T. Whitaker, and M. C. Noger. 1992. *Three structural cross sections through selected deep wells within and adjacent to the Paducah 1° x 2° quadrangle, southern Illinois, southeastern Missouri and western Kentucky.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 53- 57.

Schock, S. C., **and E. Mehnert.** 1991. *Ground-water vulnerability ranking—tested in the field.* Program with Abstracts, 36th Annual Midwest Ground Water Conference. Indianapolis. p. 86-87.

Seyler, B., and D. S. Beaty. 1991. *The effects of diagenesis on framework grains in two sandstones of Middle Mississippian age, Illinois Basin.* Geological Society of America, Abstracts with Programs, V. 23, No. 5. p. A410.

Spiker, E. C., R. B. Finkelman, A. L. Bates, J. R. Hatch, and **R. D. Harvey.** *Sulfur geochemistry of a sphalerite-bearing Illinois Basin coal.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 60-61.

Su, W.-J. 1991. *Study of earthquake-induced landslides in southern Illinois near the New Madrid Seismic Zone.* Geological Society of America, Abstracts with Programs, V. 23, No. 5. p. A43.

Treworgy, C. G., M. H. Bargh, R. J. Jacobson, and G. K. Coats. 1992. *Assessment of the coal resources in the Paducah Quadrangle.* In Goldhaber, M. B., and **J. J. Eidel,** editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 64-65.

Treworgy, J. D., D. R. Kolata, and M. L. Sargent. 1992. *Tectonic subsidence, eustasy and epeirogeny in the Illinois Basin during the Paleozoic.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 68.

Treworgy, J. D., and S. T. Whitaker. 1992. *The Illinois Basin in cross section.* In Goldhaber, M. B., and J. J. Eidel, editors. Mineral Resources of the Illinois Basin in the Context of Basin Evolution. U.S. Geological Survey Open File Report 92-1. p. 65-66.

Weibel, C. P. 1992. *Sequence stratigraphic applications: A modified Pennsylvanian cyclothem as a stratal unit.* Geological Society of America, Abstracts with Programs. V. 24, No. 4. p. 71.

Williams, A. D., and C. W. Kruse. 1991. *Premium mild gasification liquid: Char and/or tar recycle and/or lime additive.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 2.

Wilson, R. D. 1991. *Information system on Illinois coal: ICBIB maintenance, FY 91.* Abstracts of Papers, Ninth Annual Contractors Technical Meeting. Illinois Coal Development Board, Department of Energy and Natural Resources. Springfield. p. 53.

Zagula, S. J., and J. B. Risatti. 1992. *Cost-effective technologies for remedial action at agrichemical facilities.* Proceedings of the 47th Annual Purdue University Industrial Waste Conference. W. Lafayette, IN. May 11-13, 1992. p. 3.

Articles in Peer-Reviewed Journals

Barnhardt, M. L., and D. J. Kunken. 1991. *Identifying buried soils and geomorphic surfaces on flood plains.* Journal of the Tennessee Academy of Sciences. V. 66, No. 3. p. 89-93.

Baxter, J. W., P. Lapish, and H. R. Schwalb. 1991. *Illinois portions of cross sections.* In Mugel, D. N., and W. P. Pratt, compilers. Lithologic cross sections of Phanerozoic rocks in the northern midcontinent, U.S.A. U.S. Geological Survey Miscellaneous Field Studies MF-1835-G. 7 sheets with pamphlet.

Bhagwat, S. B. 1992. *Economics of utilization of high-sulfur coal resources—An integrated market approach.* Preprint of Papers, Society for Mining, Metallurgy and Exploration (SME), 121st Annual Meeting. Phoenix. February 24-27, 1992. Preprint No. 92-152.

Bhagwat, S. B., and R. C. Berg. 1992. *Environmental benefits versus costs of geologic mapping.* Environmental Geology and Water Sciences. V. 19, No. 1. p. 33-40.

Chou, C.-L. 1991. *Distribution and forms of chlorine in Illinois Basin coals.* In Stringer, J., and D. D. Bannerjee, editors. Coal Science and Technology 17. Elsevier Scientific Publishers, New York. p. 11-29.

Chrzastowski, M. J., F. A. Pranschke, and C. W. Shabica. 1991. *Discovery and preliminary investigation of the remains of an early Holocene forest on the floor of southern Lake Michigan.* Journal of Great Lakes Research. V. 17, No. 4, p. 543-552.

Demissie, M., R. A. Cahill, and W. P. FitzPatrick. 1992. *Sedimentation in the Cache River wetlands: Comparison of two methods.* Illinois State Water Survey Miscellaneous Publication 129. 43 p.

Dreher, G. B. 1991. *Atomic spectroscopy.* Journal of Environmental Quality. V. 20. p. 879.

Dreher, G. B., and R. B. Finkelman. 1992. *Selenium mobilization in a surface coal mine, Powder River Basin, Wyoming, U.S.A.* Environmental Geology and Water Science. V. 19, No. 3. p. 155-167.

Frankie, W. T., J. M. Masters, and R. E. Hughes. 1992. *Annual review of 1991 mineral exploration activities in Illinois.* Mining Engineering. V. 44, No. 5. p. 433-434.

Gass, K. C., G. D. Edgecombe, L. Ramskold, D. G. Mikulic, and R. Watkins. 1991. *Silurian Encrinurinae (Trilobita) from the central United States.* Journal of Paleontology. V. 66. p. 75-89.

Goldie, D. J., N. E. Booth, C. Patel, and G. L. Salmon. 1991. *Transport phenomena in single crystal superconducting niobium.* Physica B. V. 169, No. 4. p. 445-446.

Hackley, K. C., C.-L. Liu, D. D. Coleman, and C. W. Kruse. 1992. *Tracking forms of sulfur in coal research using natural $^{34}S/^{32}S$ ratios.* In Meuzelaar, H.L.C., editor. Advances in Coal Spectroscopy. Plenum Press, New York. p. 69-89.

Hensel, B. R., and M. V. Miller. 1991. *Effects of wetland creation on ground-water flow.* Journal of Hydrology. V. 126, p. 293-314.

Indorante, S. J., R. D. Hammer, P. G. Koenig, and L. R. Follmer. 1991. *Reply to comments on "Particle size analysis by a modified pipette procedure."* Soil Science Society of American Journal. V. 55, No. 2. p. 572.

Kempton, J. P., W. H. Johnson, P.C. Heigold, and K. Cartwright. 1991. *Mahomet bedrock valley in east-central Illinois; topography, glacial drift stratigraphy, and hydrogeology.* In Melhorn, W. N., and J. P. Kempton, editors. Geology and Hydrogeology of the Teays-Mahomet Bedrock Valley System. Geological Society of America Special Paper 258. Boulder. p. 91-124.

Kluessendorf, J., and D. G. Mikulic. 1992. *An extraordinary soft-bodied fossil biota from Waukesha: The fossils that made Waukesha famous.* Wisconsin Academy of Sciences Review. V. 38. p. 30-33.

Kolata, D. R., T. J. Frest, and R. H. Mapes. 1991. *The youngest carpoid: Occurrence, affinities and life mode of a Pennsylvanian (Morrowan) mitrate from Oklahoma.* Journal of Paleontology. V. 65, No. 5. p. 844- 855.

Kovacic, D. A., and **R. A. Cahill.** 1992. *Compost. Brown gold or toxic trouble?* Environmental Science and Technology. V. 26, No. 1. p. 38-41.

Kruse, C. W., A. D. Williams, and C. Feizoulof. 1991. *Benefits of using calcium-oxide additive in the mild gasification of coal.* In Dugan, P. R., D. R. Quigley, and Y. A. Attia, editors. Processing and Utilization of High- Sulfur Coals IV. Elsevier Scientific Publishers. New York. p. 97-108.

Larson, T. H., and A. T. Hsui. 1992. *An analytical study of a two-layer transient thermal conduction problem as applied to soil temperature surveys.* Geophysics. V. 57, No. 2. p. 306-312.

Lewis-Bevan, W., R. D. Gaston, J. Tyrrell, W. D. Stork, and **G. L. Salmon.** 1992. *Formyl cyanide: A stable species. Experimental and theoretical studies.* Journal of the American Chemical Society. V. 114, No. 6. p. 1933-1938.

Liu, C.-L., D. L. Asch, B. W. Fisher, and D. D. Coleman. 1992. *Illinois State Geological Survey radiocarbon dates X.* Radiocarbon. V. 34, No. 1.

Melhorn, W. N., and **J. P. Kempton,** editors. 1991. *Geology and hydrogeology of the Teays-Mahomet bedrock valley system.* Geological Society of America Special Paper 258. Boulder. 128 p.

Melhorn, W.N., and **J.P. Kempton.** 1991. *Introduction.* In Melhorn, W. N., and **J. P. Kempton,** editors, 1991. Geology and Hydrogeology of the Teays-Mahomet Bedrock Valley System. Geological Society of America Special Paper 258. Boulder. p. 1-2.

Melhorn, W. N., and **J.P. Kempton.** 1991. *The Teays system: A summary.* In Melhorn, W. N., and **J.P. Kempton,** editors. 1991. Geology and Hydrogeology of the Teays-Mahomet Bedrock Valley System. Geological Society of America Special Paper 258. Boulder. p. 125-128.

Mehnert, E. 1992. *A code to generate random identifiers and select QA/QC samples.* Ground Water. V. 30, No. 3. p. 437-439.

Mikulic, D. G., and J. Kluessendorf. 1991. *Soft-bodied fossils from the Silurian of Wisconsin.* Mid-America Paleontological Society Digest. Expo XIII edition. p. 108-115.

K. M. Miller, S. Risanico, and **J. B. Risatti.** 1992. *Differential tolerance of Sulfolobus strains to transition metals.* FEMS Microbiology Letters. V. 93. p. 69-74.

Moran, D. L., and M. Rostam-Abadi. 1991. *High surface area hydrated lime and methods.* Patent application (continuation, in part) filed with the U. S. Patent Office and patent offices of Australia, Canada, England, Germany, and Japan.

Moran, D. L., and M. Rostam-Abadi, H. Yoon, and J. A. Withum. 1991. *Production and coolside pilot plant testing of high surface area hydrated lime.* In Dugan, P. R., editor. Coal Science and Technology 18: Processing and Utilization of High Sulfur Coals. Elsevier Scientific Publishing Co. New York. p. 701-721.

Nelson, W. J., and R. A. Bauer. 1991. *Coping with tectonic stress in the Illinois Basin coal field.* In Peters, D. C., editor. Geology in Coal Resource Utilization. TechBooks. Fairfax, VA. p. 321-334.

Panno, S. V., B. L. Herzog, K. Cartwright, K.R. Rehfeldt, **I. G. Krapac, and B. R. Hensel.** 1991. *Field-scale investigation of infiltration into a compacted soil liner.* Ground Water. V. 29, No. 6. p. 914-921.

Radovic, L. R., **A. A. Lizzio,** and H. Jiang. 1991. *Reactive surface area: An old but new concept in carbon gasification.* In LaHaye, J., and P. Ehrburger, editors. Fundamental Issues in Control of Carbon Gasification Reactivity. NATO ASI Series E. Applied Sciences. V. 192. Kluwer Academic Publishers. Dordrecht, The Netherlands. p. 235-256.

Rhoads, B. L., and **M. V. Miller.** 1991. *Impact of flow variability on the morphology of a low-energy, meandering river.* Earth Science Processes and Landforms. V. 16. p. 357-361.

Risatti, J. B. 1992. *Rates of microbial dechlorination of polychlorinated biphenyls (PCB) in anaerobic sediments from Waukegan Harbor.* Hazardous Waste Research and Information Center Research Reports. Champaign. 36 p.

Roy, W. R., B. Seyler, J. D. Steele, S. C. Mravik, D. M. Moore, I. G. Krapac, J. M. Peden, and R. A. Griffin. 1991. *Geochemical transformations and modeling of two deep-well injected hazardous wastes.* Journal of Ground Water. V. 29. p. 671-677.

Soller, D. R., and **R. C. Berg.** 1992. *Methodology for the regional assessment of aquifer contamination based on geologic framework.* Environmental Geology and Water Sciences, V. 19, No. 3. p. 205-213.

Terpstra, P. D., and M. J. Chrzastowski. 1992. *Geometric trends in the evolution of a small log-spiral embayment on the Illinois shore of Lake Michigan.* Journal of Coastal Research, V. 8, No. 3. p. 603-617.

Treworgy, C. G. 1991. *Techniques for estimating the coal reserve base of a region using a geographic information system: A case study from Illinois.* In Peters, D. C., editor. Geology in Coal Resource Utilization. TechBooks. Fairfax, VA. p. 59-67.

Treworgy, C. G. 1992. *Designing a stratigraphic database: An example from the coal section of the Illinois State Geological Survey.* Geobyte. V. 7, No. 2. p. 33-37.

Troost, K. G., and **B. B. Curry.** 1991. *Genesis and continuity of Quaternary sand and gravel in glacigenic sediment at a proposed low-level radioactive waste disposal site in east-central Illinois.* Environmental Geology and Water Sciences. V. 18, No. 3. p. 159-170.

ILLINOIS GEOLOGICAL
SURVEY LIBRARY
MAR 10 1993

Udegbunam, E. O. 1991. *A FORTRAN program for interpretation of relative permeability from unsteady-state displacements with capillary pressure included.* Computers and Geosciences. V. 17, No. 10. p. 1351- 1357.

Weibel, C. P., and R.C. Berg. 1991. *Importance of geologic characterization of potential low-level radioactive waste disposal sites.* Environmental Geology and Water Sciences, V. 18, No. 3. p. 209-214.

Weibel, C. P., and R. D. Norby. 1992. *Paleopedology and conodont biostratigraphy of the Mississippian-Pennsylvanian boundary interval, type Grove Church Shale area, southern Illinois.* In Sutherland, P. K., and W. L. Manger, editors. Recent Advances in Middle Carboniferous Biostratigraphy—A Symposium. Oklahoma Geological Survey Circular 94. p. 39-53.

Articles in Proceedings Volumes

Abert, C. C., R. R. Pool, M. H. Riggs, M. M. McLean, E. D. McKay III, and R. J. Krumm. 1992. *Using USGS DLG hypsography data.* Proceedings of the Twelfth Annual ESRI User Conference. V. II. p. 83-88.

Bhagwat, S. B. 1991. *Is coal price linked to oil prices? Analysis of U.S. fossil fuel prices in 1971-1988.* In Hilt, R. H., editor. Energy DisruptionsLessons, Opportunities, Prospects. Proceedings of the 13th Annual North American Conference of the International Association for Energy Economics. Chicago. November 18-20, 1991. p. 208-217.

Bauer, R. A., and D. J. Van Roosendaal. 1992. *Monitoring problems: Are we really monitoring coal mine subsidence.* Peng, S. S., editor. Proceedings, Third Workshop on Surface Subsidence Due to Underground Mining. Morgantown, WV. June 1-4, 1992. p. 332-338.

Berg, R. C., and J. P. Kempton. 1991. *Section VII. Application of regional, local and site maps of Quaternary deposits.* In **Kempton, J. P., R. C. Berg, L. R. Follmer, A. K. Hansel,** and D.R. Soller, editors. Short Course No. 3. Notebook. Glacial Geology of the Midwest: Framework and Applications. Association of Engineering Geologists, 34th Annual Meeting. St. Charles, IL. p. 69-82.

Chrzastowski, M. J. 1992. *Coastal geomorphic characteristics of southern Lake Michigan.* In Folger, D. W., S. M. Colman, and P. W. Barnes,editors. Fourth Annual Southern Lake Michigan Coastal Erosion Workshop. U.S. Geological Survey Open File Report 92-324. p. 18-23.

Chrzastowski, M. J., and P. D. Terpstra. 1992. *Summary of 1987 to 1991 monitoring of coastal erosion in the vicinity of North Point marina, Winthrop Harbor, IL.* In Folger, D. W., S. M. Colman and P. W. Barnes, editors. Fourth Annual Southern Lake Michigan Coastal Erosion Workshop. U.S. Geological Survey Open File Report 92-324. p. 60-62.

Curry, B. B., and K. G. Troost. 1991. *Glacial stratigraphic framework of the Martinsville Alternative Site, a proposed low-level radioactive waste disposal site in east-central Illinois.* Proceedings of the 34th Annual Meeting, Association of Engineering Geologists. St. Charles, IL. September 29-October 4, 1991. p. 366-376.

DeBarr, J. A., M. Rostam-Abadi, R. D. Harvey, and C. W. Kruse. 1991. *Properties of mild gasification chars: A comparison of pilot plant- and laboratory-prepared samples.* American Chemical Society, Fuels Division, Preprints of Papers. V. 37, No. 1. p. 403-409.

Follmer, L. R. 1991. *Problems in paleopedological research.* 13th Research Congress, International Union for Quaternary Research (INQUA). Plenary Session Review Reports, Special Proceedings. Beijing, China. p. 121-122.

Follmer, L. R. 1991. *Loess and soil research in the Mississippi Valley region.* In **Kempton, J. P., R. C. Berg, L. R. Follmer, A. K. Hansel,** and D. R. Soller, editors. Short Course No. 3. Notebook. Glacial Geology of the Midwest: Framework and Applications. Association of Engineering Geologists, 34th Annual Meeting, St. Charles, IL. p. 24-41.

Goldhaber, M. B., and **J. J.Eidel,** editors. 1992. *Mineral Resources of the Illinois Basin in the Context of Basin Evolution,* Program and Abstracts. U.S. Geological Survey Open File Report 92-1. 68 p.

Hackley, K. C., and C.-L. Chou. 1992. *Evolution of volatile sulfur compounds during temperature-programmed pyrolysis-combustion with a quadrupole gas analyzer.* American Chemical Society, Division of Fuel Chemistry, Preprints of Papers. V. 37, No. 2. p. 738-744.

Heidari, M. 1992. *Estimation of parameters for local and regional aquifer systems.* Proceedings of the 85th Annual Meeting and Exhibition, Air and Water Management Association. Kansas City, MO. June 21-26, 1992. Paper No. 92.4-11. 7 p.

Johnson, W. H., and **A. K. Hansel.** 1991. *Glacial and related processes and environments.* In **Kempton, J. P., R. C. Berg, L. R. Follmer, A. K. Hansel,** and D. R. Soller, editors. Short Course No. 3. Notebook. Glacial Geology of the Midwest: Framework and Applications. Association of Engineering Geologists, 34th Annual Meeting. St. Charles, IL. p. 17-24.

Kempton, J. P., R. C. Berg, L. R. Follmer, A. K. Hansel, and D. R. Soller, editors. *Short Course No. 3. Notebook. Glacial Geology of the Midwest: Framework and Applications.* Association of Engineering Geologists, 34th Annual Meeting. St. Charles, IL. 111 p.

Krapac, I. G., K. Cartwright, S. V. Panno, B. R. Hensel, K. H. Rehfeldt, and **B. L. Herzog.** 1991. *Water movement through an experimental soil liner.* Waste Management and Research. V. 9. Copenhagen Denmark. p. 195-204.

Kruse, C. W., and A. D. Williams. 1991. *Approaches for improving coal pyrolysis performance.* Proceedings of the Eighth Annual International Pittsburgh Coal Conference. October 14-18, 1991. p. 177-182.

Kujansuu, R., M. Saarnisto, M.-J. Raisanen, and **A. K. Hansel.** 1991. *Fossil soil of Karjenkoski and its correlatives in Ostrobothnia, western Finland.* Geological Survey of Finland Special Paper 12: Current Research 1989- 1990. Helsinki, Finland. p. 119-126.

Kruse, C. W., M.-I. M. Chou, C. Feizoulof, M. Fatemi, P. Beaulieu, and J. Schreiner. 1992. *Oxidized coal char as a catalyst: I. Characterization.* American Chemical Society, Fuel Chemistry Division, Preprints of Papers. V. 37, No. 2. p. 556-563.

Lizzio, A. A., and M. Rostam-Abadi. 1992. *Production of carbon molecular sieves from Illinois coals.* American Chemical Society, Fuels Division, Preprints of Papers. V. 37, No. 2. p. 512-523.

McKenna, D. P., J. B. Risatti, W. R. Roy, I. G. Krapac, and E. Mehnert. 1991. *Groundwater contributions to atrazine loadings in streams: First-year summary.* Proceedings of the Second Annual Conference. Illinois Groundwater Consortium. Springfield. April 2, 1991. p. 41-43.

Mehnert, B. B., D. J. Van Roosendaal, and R. A. Bauer. 1992. *Long-term monitoring of subsidence over a long-wall coal mine in southern Illinois.* Peng, S. S., editor. Proceedings, Third Workshop on Surface Subsidence Due to Underground Mining. Morgantown, WV. June 1-4, 1992. p. 311- 316.

Mehnert, E., and S.C. Schock. 1991. *Survey of rural private wells: Statistical design.* In Lannon, G. P., editor. Proceedings of the International Symposium on Ground Water. Nashville. July 29- August 2, 1991. American Society of Civil Engineers. p. 305-310.

Mehnert, E., S.-F. J. Chou, G. B. Dreher, J. R. Valkenburg, S. C. Schock, and M. Caughey. 1992. *Pilot study: Agricultural chemicals in rural private wells.* Summaries of Presentations, Illinois Agricultural Pesticides Conference '92. University of Illinois at Urbana-Champaign. January 8- 10, 1992. p. 155-167.

Mehnert, E., S.-F. J. Chou, G. B. Dreher, J. R. Valkenburg, S. C. Schock, and M. E. Caughey. 1992. *Pilot Study: Agricultural chemicals in rural private wells.* Proceedings of the Illinois Agricultural Pesticides Conference '92. University of Illinois at Urbana-Champaign. January 8- 10, 1992. p. 146-154.

Oltz, D. F., H. E. Leetaru, B. Seyler, and S. T. Whitaker. 1991. *An integrated approach to reservoir characterization in the Illinois Basin.* Proceedings of the First Annual Archie Conference. Houston. October 22-25, 1991. American Association of Petroleum Geologists. Tulsa. p. 38-60.

Panno, S. V., B. L. Herzog, I. G. Krapac, K. R. Rehfeldt, and K. Cartwright. 1991. *Infiltration measurements of a field-scale compacted soil liner.* Journal of Ground Water. V. 29, No. 6. p. 914-921.

Ray, C., S. D. Wilson, S. C. Schock, J. M. Gosar, J. R. Karny, **E. Mehnert, W. S. Dey, and M. R. Greenpool.** 1991. *Agricultural chemicals in rural private wells.* In Lennon, G. P., editor. Proceedings of the International Symposium on Groundwater. Nashville. July 29-August 2, 1991. American Society of Civil Engineers. p. 256-261.

Riggs, M. H., C. C. Abert, M. M. McLean, R. R. Pool, E. D. McKay III, and R. J. Krumm. 1992. *Using U.S. Geological Survey 1:24,000 DLG hypsography.* Proceedings of the Twelfth Annual ESRI User Conference. V. II. p. 391-394.

Rostam-Abadi, M., J. A. DeBarr, and R. D. Harvey. 1991. *Ash deposition behavior of a coal, a physically-cleaned coal and a char in a drop- tube furnace.* American Chemical Society, Fuels Division, Preprints of Papers. V. 37, No. 1. p. 395-402.

Rostam-Abadi, M., J. A. DeBarr, and W. T. Chen. 1991. *Combustion studies of coal-derived solid fuels: IV. Correlation of ignition temperatures from thermogravimetry and free-floating experiments.* In Keating, M. Y., editor. Proceedings, 20th Conference, North American Thermal Analysis Society. Minneapolis. September 22-25, 1991. p. 418- 425.

Rostam-Abadi, M., and D. L. Moran. 1991. *Development and evaluation of high surface area hydrated lime for SO_2 control.* Proceedings, 1991 EPRI/EPA SO_2-Control Symposium. Washington, DC. December 3-6, 1991. p. 11-25.

Shao, D., W.-P. Pan, and **C.-L. Chou.** 1992. *Monitoring of sulfur in coal during pyrolysis by simultaneous TG/FTIR technique.* American Chemical Society, Division of Fuel Chemistry, Preprints. V. 37, No. 1. p. 108-115.

Shao, D. W.-P. Pan, J. T. Riley, and **C.-L. Chou.** 1992. *Behavior of chlorine in coal during pyrolysis.* Proceedings of the 9th International Coal Testing Conference. p. 40-45.

Stohr, C. J. 1991. *Introduction. Symposium on interpretation of historical maps and aerial photography for environmental property assessments.* Proceedings, 34th Annual Meeting, Association of Engineering Geologists. Chicago. September 30-October 4, 1991. p. 283-284.

Stohr, C. J., and W.-J. Su. 1991. *Interpretation of landslides along the Ohio and Mississippi Rivers using small and medium-scale aerial photography and SLAR imagery.* Proceedings, 34th Annual Meeting, Association of Engineering Geologists. Chicago. September 30-October 4, 1991. p. 805-814.

Udegbunam, E. O., J. P. Adkins, R. M. Knapp, M. J. McInerney, and R. S. Tanner. 1991. *Assessing the effects of microbial metabolisms and metabolites on reservoir pore structure.* Preprints of Papers, Society of Petroleum Engineers, 1991 Technical Conference and Exhibition. Dallas. October 6-9, 1991. Paper No. SPE 22846. p. 309-316.

Van Roosendaal, D. J., B. B. Mehnert, J. T. Kelleher III, and C.E. Ovanic. 1991. *Three-dimensional ground movements associated with longwall mine subsidence in Illinois.* Proceedings, 34th Annual Meeting, Association of Engineering Geologists. Chicago. September 29-October 4, 1991. p. 815-826.

Van Roosendaal, D. J., B. B. Mehnert, and R. A. Bauer. 1992. *Three-dimensional ground movements during dynamic subsidence of a longwall mine in Illinois.* Peng, S. S., editor. Proceedings, Third Workshop on Surface Subsidence Due to Underground Mining. Morgantown, WV. June 1-4, 1992. p. 290-298.

Other Publications

Bannon, P. L., R. J. Farrell, K. M. O'Connor, and L. R. Smith. 1992. *Critical Trends Assessment Project: A Partially Annotated Bibliography.* Report delivered to the Department of Energy and Natural Resources, Springfield, in partial fulfillment of contract obligations. June 1992.

Chrzastowski, M. J. 1991. *Coastal geology and coastal engineering of the Illinois shore of Lake Michigan (field trip no. 6).* In **Killey, M. M.,** editor, Field Trip Guidebook for the 34th Annual Meeting. Association of Engineering Geologists. St. Charles, IL. p. 6/1 - 6/41.

Denhart, S. L. 1991. *INFO differences—Prime to Sun.* IGIS Newsletter. Illinois Department of Energy and Natural Resources. Springfield. V. 1 (Fall 1991).

Denhart, S. L. 1992. *INFO processing—Sun workstations.* IGIS Newsletter. Illinois Department of Energy and Natural Resources. Springfield. V. II, No. 1 (Winter 1992).

Erdmann, A. L., and N. P. Schneider. 1991. *A computational method for producing surficial deposit thickness maps.* Illinois GIS Map Notes. V. 10. p. 14-15.

Heckel, P. H., and **C. P. Weibel.** 1991. *Current status of conodont-based biostratigraphic correlation of Upper Pennsylvanian succession between Illinois and midcontinent.* In **Weibel, C. P.,** editor. Sequence Stratigraphy in Mixed Clastic-Carbonate Strata, Upper Pennsylvanian, East-Central Illinois. Guidebook for the 21st Annual Field Conference. Great Lakes Section, Society of Economic Paleontologists and Mineralogists. p. 60-69.

Huff, B. G. 1992. *Annual review, Illinois.* Northeast Oil World. V. 12, No. 6. p. 14-15.

Killey, M. M., editor. 1991. *Field Trip Guidebook for the 34th Annual Meeting.* Association of Engineering Geologists. Chicago. 163 p.

Killey, M. M. 1991. *Geologic setting of northeastern Illinois and southern Wisconsin.* In **Killey, M. M.,** editor. Field Trip Guidebook for the 34th Annual Meeting. Association of Engineering Geologists. Chicago. p. 1- 17.

Killey, M. M., and C. B. Trask. 1991. *A visit to Argonne National Laboratory and Fermi National Accelerator Laboratory (field trip no. 7).* In **Killey, M. M.,** editor. Field Trip Guidebook for the 34th Annual Meeting. Association of Engineering Geologists. Chicago. p. 7/1-7/24.

Killey, M. M., and C. B. Trask. 1991. *Public outreach: A geology field trip for county-level decision-makers in landfill site screening.* AEG NEWS. V. 34, No. 3. p. 25-26.

Mikulic, D. G., and J. Kluessendorf. 1991. *The Thornton Quarry of Material Service Corporation.* In **Killey, M. M.,** editor. Field Trip Guidebook for the 34th Annual Meeting. Association of Engineering Geologists. Chicago. p. 2/13-2/35.

Miller, M. V., and P. Kelsey. 1991. *Natural and mitigated wetlands: Structure and function in urban environments.* In **Killey, M. M.,** editor. Field Trip Guidebook for the 34th Annual Meeting. Association of Engineering Geologists. Chicago. p. 3/1-3/21.

Panno, S. V. 1991. *Groundwater: Where it comes from, where it goes. Short primer on groundwater for lay persons.* Prepared for Groundwater Protection Education program. Published in Nature of Illinois, Winter 1992, p. 9-10; Illinois Rural Electric News, July 1991, p. 4-7; Illinois Pork Press, July 1991, p. 16-17.

Rostam-Abadi, M. 1991. *High surface area hydrated lime project.* Illinois Coal Update. V. 3, No. 1. Office of Coal Marketing and Development, Illinois Department of Energy and Natural Resources. Springfield.

Roy, W. R., and I. G. Krapac. 1992. *Adsorption-desorption behavior of atrazine and de-ethylatrazine by low organic-carbon geologic materials.* Progress report submitted to CIBA/Geigy Corp., Greensboro, NC. 23 p.

Roy, W. R., I. G. Krapac, S.-F.J. Chou, and R. A. Griffin. 1992. *Batch-type procedures for estimating soil attenuation of chemicals.* U.S. Environmental Protection Agency, Technical Resource Document. EPA/530-SW-87-006-F (NTIS PB 146-155). 100 p.

Shabica, C. W., F. A. Pranschke, and **M. J. Chrzastowski.** 1991. *Survey of littoral drift sand deposits along the Illinois shore of Lake Michigan from Fort Sheridan to Evanston.* Illinois-Indiana Sea Grant Program Technical Report No. IL-IN-SG R-91-3. Champaign. 15 p.

Stohr, C.J. 1991. *Remote sensing for environmental assessment.* Hazardous waste site assessment and instrumentation. Short course notes and outlines. University of Wisconsin-Milwaukee. August 19-20, 1991.

Weibel, C. P., editor. 1991. *Sequence stratigraphy in mixed clastic-carbonate strata, Upper Pennsylvanian, east-central Illinois.* Guidebook for the 21st Annual Field Conference. Great Lakes Section, Society of Economic Paleontologists and Mineralogists. 80 p.

Weibel, C. P. 1991. *Application of cyclothemic-based sequence stratigraphy to Upper Pennsylvanian strata, east-central Illinois.* In **Weibel, C. P.,** editor. Sequence Stratigraphy in Mixed Clastic-Carbonate Strata, Upper Pennsylvanian, East-Central Illinois. Guidebook for the 21st Annual Field Conference. Great Lakes Section, Society of Economic Paleontologists and Mineralogists. p. 1-25.

Weibel, C. P., R. L. Langenheim, Jr., and J. F. Stratton. 1991. *Field trip stops.* In **Weibel, C. P.,** editor. Sequence Stratigraphy in Mixed Clastic-Carbonate Strata, Upper Pennsylvanian, East-Central Illinois. Guidebook for the 21st Annual Field Conference. Great Lakes Section, Society of Economic Paleontologists and Mineralogists. p. 34-59.